

WHAT IS CLAIMED IS:

1. A method for driving a liquid crystal display by applying AC pulses to a liquid crystal layer through a plurality of scan electrodes and a plurality of data electrodes which face and cross each other, in which the scan electrodes are selected for scanning successively at specified time intervals, said method comprising:

a reset step of applying a reset pulse, which is to reset liquid crystal of the liquid crystal layer to a predetermined state, to an area of the liquid crystal layer that corresponds to a selected one of the scan electrodes; and

a selection step of applying a selection pulse, which is to select a final state of the liquid crystal, to the area of the liquid crystal after the reset step;

wherein:

a pulse applied to the selected one of the scan electrodes during the reset step has an amplitude which is larger than a maximum amplitude of pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the reset pulse has an alternating cycle which is longer than that of the selection pulse.

2. The method according to claim 1, further comprising an evolution step of applying an evolution pulse, which is to cause the liquid crystal to evolve to the selected final state, to the area of the liquid crystal layer.

3. The method according to claim 2, wherein:

a pulse applied to the selected one of the scan electrodes during the evolution step has an amplitude which is larger than the maximum amplitude of the pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the evolution pulse has an alternating cycle which is longer than that of the selection pulse.

4. The method according to claim 1, wherein the polarity inversion cycle of the reset pulse is sufficiently long to prevent the liquid crystal from being polarized.

5. The method according to claim 1, wherein the time intervals to select the scan electrodes successively is determined based on a time defined by the selection pulse.

6. The method according to claim 1, wherein the maximum amplitude of the pulses applied to each of the data electrodes is lower than a threshold to change the state of the liquid crystal.

7. The method according to claim 1, wherein the liquid crystal exhibits a cholesteric phase having a selection reflective characteristic.

8. The method according to claim 7, wherein the liquid crystal exhibits bistability between a planar state and a focal-conic state.

9. A method for driving a liquid crystal display by applying AC pulses to a liquid crystal layer through a plurality of scan electrodes and a plurality of data electrodes which face and cross each other, in which the scan electrodes are selected for scanning successively at specified time intervals, said method comprising:

a selection step of applying a selection pulse, which is to select a final state of the liquid crystal, to an area of the liquid crystal layer that corresponds to a selected one of the scan electrodes; and

an evolution step of applying an evolution pulse, which is to cause the liquid crystal to evolve to the selected final state, to the area of the liquid crystal layer;

wherein a pulse applied to the selected one of the scan electrodes during the evolution step has an amplitude which is larger than a maximum amplitude of pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the evolution pulse has an alternating cycle which is longer than that of the selection pulse.

10. The method according to claim 9, further comprising a reset step of applying a reset pulse, which is to reset liquid crystal of the liquid crystal layer to a predetermined state, to the area of the liquid crystal layer.

11. The method according to claim 9, wherein the polarity inversion cycle of the evolution pulse is sufficiently long to prevent the liquid crystal from being polarized.

12. The method according to claim 9, wherein the time intervals to select the scan electrodes successively is determined based on a time defined by the selection pulse.

13. The method according to claim 9, wherein the maximum amplitude of the pulses applied to each of the data electrodes is lower than a threshold to change the state of the liquid crystal.

14. The method according to claim 9, wherein the liquid crystal exhibits a cholesteric phase having a selective reflection characteristic.

15. The method according to claim 14, wherein the liquid crystal exhibits bistability between a planar state and a focal-conic state.

16. A liquid crystal display device comprising:

a liquid crystal display comprising:

a plurality of scan electrodes;

a plurality of data electrodes crossed over the scan electrodes; and

a liquid crystal layer sandwiched between the scan electrodes and the data electrodes, said liquid crystal layer including liquid crystal; and

a driver which is connected to the scan electrodes and to the data electrodes, the driver being adapted to scan the liquid crystal display by successively selecting the scan electrodes at specified time intervals and thereby applying AC pulses to an area of the liquid crystal layer

09866287 052501

corresponding to a selected one of the scan electrodes, the AC pulses comprising:

a reset pulse, which is to reset liquid crystal of the liquid crystal layer to a predetermined state, to the area of the liquid crystal layer during a reset step; and

a selection pulse, which is to select a final state of the liquid crystal, to the area of the liquid crystal during a selection step that is subsequent to the reset step;

wherein a pulse applied to the selected one of the scan electrodes during the reset step has an amplitude which is larger than a maximum amplitude of pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the reset pulse has an alternating cycle which is longer than that of the selection pulse.

17. The liquid crystal display device according to claim 16, wherein the AC pulses further comprise an evolution pulse, which is to cause the liquid crystal to evolve to the selected final state, to the area of the liquid crystal layer during an evolution step that is subsequent to the selection step.

18. The liquid crystal display device according to claim 17, wherein the evolution pulse has an amplitude which is larger than the maximum amplitude of the pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the evolution pulse has an alternating cycle which is longer

than that of the selection pulse.

19. The liquid crystal display device according to claim 16, wherein the polarity inversion cycle of the reset pulse is sufficiently long to prevent the liquid crystal from being polarized.

20. The liquid crystal display device according to claim 16, wherein the time intervals to select the scan electrodes successively is determined based on a time defined by the selection pulse.

21. The liquid crystal display device according to claim 16, wherein the maximum amplitude of the pulses applied to each of the data electrodes is lower than a threshold to change the state of the liquid crystal.

22. The liquid crystal display device according to claim 16, wherein the liquid crystal exhibits a cholesteric phase having a selective reflection characteristic.

23. The liquid crystal display device according to claim 22, wherein the liquid crystal exhibits bistability between a planar state and a focal-conic state.

24. A liquid crystal display device comprising:  
a liquid crystal display comprising:  
a plurality of scan electrodes;

a plurality of data electrodes crossed over the scan electrodes; and

a liquid crystal layer sandwiched between the scan electrodes and the data electrodes, said liquid crystal layer including liquid crystal; and

a driver which is connected to the scan electrodes and to the data electrodes, the driver being adapted to scan the liquid crystal display by successively selecting the scan electrodes at specified time intervals and thereby applying AC pulses to an area of the liquid crystal layer corresponding to a selected one of the scan electrodes, the AC pulses comprising:

a selection pulse, which is to select a final state of the liquid crystal, to the area of the liquid crystal during a selection step; and

an evolution pulse, which is to cause the liquid crystal to evolve to the selected final state, to the area of the liquid crystal layer during an evolution step that is subsequent to the selection step;

wherein a pulse applied to the selected one of the scan electrodes during the evolution step has an amplitude which is larger than a maximum amplitude of pulses applied to each of the data electrodes and has a polarity maintaining period which is longer than that of the selection pulse, so that the evolution pulse has an alternating cycle which is longer than that of the selection pulse.

25. The liquid crystal display device according to claim 24, wherein the AC pulses further comprise a reset pulse, which is to reset the liquid crystal to a predetermined state, to the area of the liquid crystal layer

during a reset step that is prior to the selection step.

26. The liquid crystal display device according to claim 24, wherein the polarity inversion cycle of the reset pulse is sufficiently long to prevent the liquid crystal from being polarized.

27. The liquid crystal display device according to claim 24, wherein the time intervals to select the scan electrodes successively is determined based on a time defined by the selection step.

28. The liquid crystal display device according to claim 24, wherein the maximum amplitude of the pulses applied to each of the data electrodes is lower than a threshold to change the state of the liquid crystal.

29. The liquid crystal display device according to claim 24, wherein the liquid crystal exhibits a cholesteric phase having a selective reflection characteristic.

30. The liquid crystal display device according to claim 28, wherein the liquid crystal exhibits bistability between a planar state and a focal-conic state.